HIGH-SPEED ELECTRICAL ROUTER BACKPLANE WITH NOISE-ISOLATED POWER DISTRIBUTION

ABSTRACT OF THE DISCLOSURE

A high-speed router backplane is disclosed. Because of the large number of high-speed conductive traces present in such a backplane, electromagnetic interference (EMI) can be a serious issue. And because such a router consumes significant amounts of power, some provision must exist (e.g., bus bars in the prior art) within the router for distributing power to the router components. In preferred embodiments, power distribution is accomplished using relatively thick (e.g., three- or four-ounce copper) power distribution planes within the same backplane used for high-speed signaling. To shield these planes from EMI, they are preferably placed near the center of the material stack, shielded from the signaling layers by adjacent digital ground planes. Also, where two power supply planes exist, the power supply planes are placed adjacent, further shielded by their respective power return planes. Each power distribution plane can also include a conductive guard ring to shield that plane from EMI injected at the board edges. And where the backplane includes both high-speed and lower speed signaling traces, at least some lower speed signaling traces are placed on signaling layers, designated as low-speed, that are closest to the power distribution planes.